

Message

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**From:** Krueger, Thomas [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=5032E094667E4AB3BCD05326C7C3CF18-TKRUEGER]  
**Sent:** 9/19/2021 4:15:49 PM  
**To:** Ohl, Matthew [ohl.matthew@epa.gov]  
**Subject:** RE: Third Site: Cost benefit analysis of thermally enhanced bioremediation vs. conventional bioremediation

# Ex. 5 Attorney Client (AC)

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**From:** Ohl, Matthew <ohl.matthew@epa.gov>  
**Sent:** Friday, September 17, 2021 3:49 PM  
**To:** DPetroff <DPetroff@idem.IN.gov>; Krueger, Thomas <krueger.thomas@epa.gov>  
**Subject:** Third Site: Cost benefit analysis of thermally enhanced bioremediation vs. conventional bioremediation

# non-responsive

Matt

Matthew J. Ohl  
Remedial Project Manager  
United States Environmental Protection Agency  
77 West Jackson Boulevard, SR-6J  
Chicago, IL 60604-3590

phone: 312.886.4442  
fax: 312.692.2447  
e-mail: [ohl.matthew@epa.gov](mailto:ohl.matthew@epa.gov)

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**From:** Julie Konzuk <[JKonzuk@Geosyntec.com](mailto:JKonzuk@Geosyntec.com)>  
**Sent:** Tuesday, August 10, 2021 11:04 PM  
**To:** Ohl, Matthew <[ohl.matthew@epa.gov](mailto:ohl.matthew@epa.gov)>  
**Cc:** [dave.j.becker@usace.army.mil](mailto:dave.j.becker@usace.army.mil); [corey.s.knox@usace.army.mil](mailto:corey.s.knox@usace.army.mil); Andrew A Gremos <[agremos@ramboll.com](mailto:agremos@ramboll.com)>; Norman Bernstein <[nwbernstein@nwbllc.com](mailto:nwbernstein@nwbllc.com)>; [pracher@psrb.com](mailto:pracher@psrb.com); Gary Wealthall <[GWealthall@Geosyntec.com](mailto:GWealthall@Geosyntec.com)>; Krueger, Thomas <[krueger.thomas@epa.gov](mailto:krueger.thomas@epa.gov)>; DPetroff <[DPetroff@idem.IN.gov](mailto:DPetroff@idem.IN.gov)>; Clabaugh, William B CIV USARMY CELRL (USA <[William.B.Clabaugh@usace.army.mil](mailto:William.B.Clabaugh@usace.army.mil)>  
**Subject:** Cost benefit analysis of thermally enhanced bioremediation vs. conventional bioremediation

Matt,

As discussed during our call on July 15, 2021, we have put together the attached memorandum summarizing the advantages, limitations and potential risks associated with implementing thermally-enhanced bioremediation compared to conventional bioremediation to treat the DNAPL phase encountered at PSGS-11 in the DNAPL Cell at Third Site. We have also included a cost benefit analysis comparing both technologies to support the discussion. As you will see in the attached document, there are additional potential risks of mobilization of mass in unknown ways that we are concerned about when heating DNAPL phase. The cost benefit analysis also demonstrates that any additional benefit in potentially reducing the lifespan of the DNAPL is outweighed by a substantial increases in costs.

We trust that this information helps to support EPA's review of our proposed work plan for BIOREMED hot-spot treatment for breakdown of the DNAPL in the PSGS-11 area in the Third Site DNAPL Cell. We look forward to hearing from you.

Regards,

Julie

**Julie Konzuk, Ph.D., P.Eng. (ON)**  
Senior Principal  
Geosyntec Consultants International, Inc.  
1243 Islington Avenue  
Suite 1201  
Toronto, ON M8X 1Y9  
Phone: 416.637.8746 Mobile: 416.271.2373

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